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FORTRAN COMPILER VALIDATION SUMMARY REPORT. HONEYWELL LEVEL 66,--ETC(U)  
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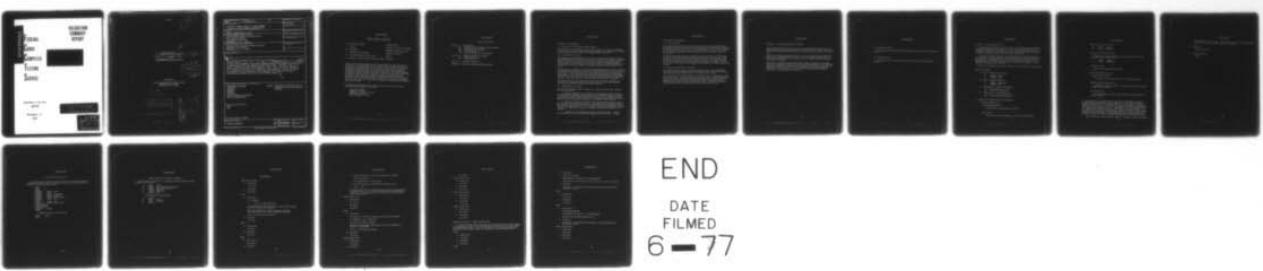
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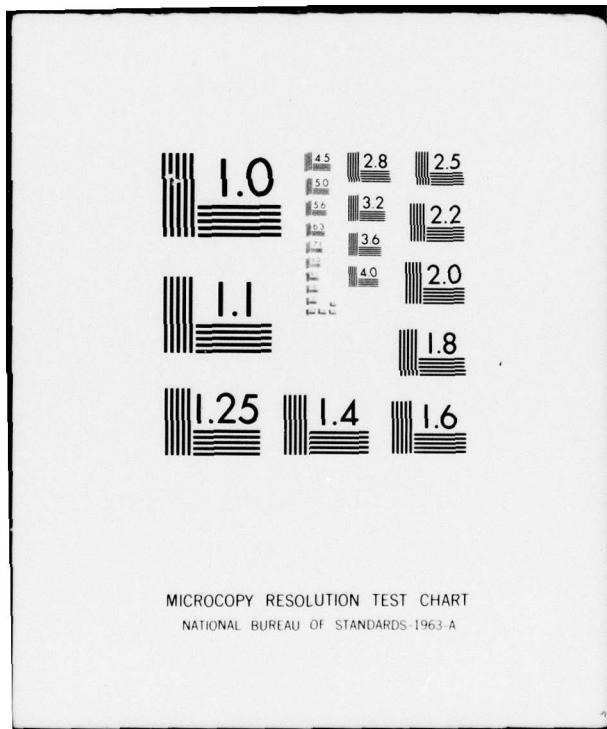
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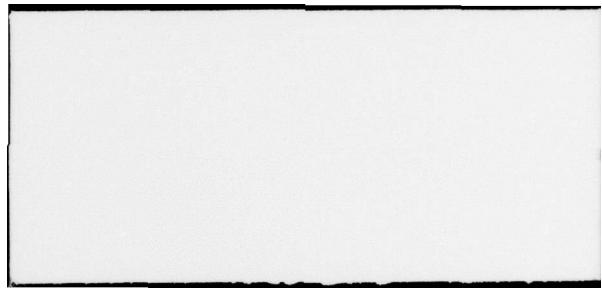
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VALIDATION SUMMARY REPORT Honeywell Level 66  
FORTAN Version 3I.  
VALIDATION NUMBER FCVS66-VSR190

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16. Abstracts  This Validation Summary Report (VSR) for the <u>Honeywell Level 66</u> FORTRAN Compiler Version <u>3I</u> ( <u>GCOS</u> Version <u>3I</u> ) provides a consolidated summary of the results obtained from the validation of the subject compiler against the 1966 FORTRAN Standard (X3.9-1966). The VSR is made up of several sections showing the discrepancies found. These include an overview of the validation which lists all categories of discrepancies; a section relating the categories of discrepancies to the language; and a detailed listing of discrepancies together with the tests which were failed.				
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FCVS66-VSR190

FORTRAN COMPILER VALIDATION

1. Validation Number	FCVS66-VSR190
2. Vendor	Honeywell Information Systems
3. Mainframe	Honeywell System Level 66
4. Compiler Identification	FORTRAN Release 3I
5. Operating System Identification	GCOS 3I
6. Compiler Validation System Version Number	FCVS66 1.1

\*PLEASE NOTE. The Department of the Navy may make full and free public disclosure of the Validation Summary Report (VSR) in accordance with the "Freedom of Information Act" (5 U.S.C. #552). The results of this validation are only for the purpose of satisfying United States Government requirements, and apply only to the Computer System, Operating System release, and compiler version identified in the VSR. The FORTRAN Compiler Validation System is used to determine, insofar as is practical, the degree to which the subject compiler conforms to American Standard FORTRAN, X3.9-1966. Thus, the VSR is necessarily discretionary and judgmental. The United States Government does not represent or warrant that the statements, or any one of them, set forth in the VSR are accurate or complete. The VSR is not meant to be used for the purpose of publicizing the findings summarized therein.

For information concerning this compiler you can contact the vendor's designated representative named below:

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## SECTION 1. INTRODUCTION

### 1.1 Purpose of the Validation Summary Report

The purpose of the Validation Summary Report (VSR) is to identify individual FORTRAN language elements whose implementation does not conform to the language specifications defined in American Standard FORTRAN, X3.9-1966.

### 1.2 Preparation of the VSR

The Validation Summary Report is prepared by analyzing the results of running the FORTRAN Compiler Validation System (FCVS). The FORTRAN Compiler Validation System consists of audit routines containing features of American Standard FORTRAN, their related data, and an Executive Routine which prepares the audit routines for compilation. Each audit routine is a FORTRAN program which includes many tests and supporting procedures indicating the result of the tests.

The testing of a compiler in a particular hardware/operating system environment is accomplished by compiling and executing each audit routine. The report produced by each routine tells whether the compiler passed or failed the tests in the routine. If the compiler rejects some language elements by terminating compilation, giving fatal diagnostic messages, or terminating execution abnormally, then the test containing the code the compiler was unable to process is deleted. The audit routine is compiled again and execution is repeated.

The compilation listings and the output reports of the audit routines constitute the raw data from which the members of the Federal COBOL Compiler Testing Service produce a Validation Summary Report.

### 1.3 Organization of the VSR

The Validation Summary Report is made up of several sections whose contents are described below.

a. Section 2 summarizes the results of the compilation and execution of the programs comprising the FORTRAN Compiler Validation System. Section 2 is divided into a subsection describing the syntax errors encountered while compiling the FORTRAN audit routines, and a subsection describing the semantic errors which occurred during execution of the FORTRAN audit routines.

b. Section 3 contains information which describes the software environment in which the compiler was tested. This includes the name and version of the operating system and the logical unit/physical device assignments used in the programs comprising the FCVS. The options used with the compiler are also given, and if applicable, the use of compiler optimization features is explained.

c. Appendix A is the Validation Summary Working Document, a working paper resulting from the compilation and execution of the FCVS. The VSR

is derived from Appendix A.

#### 1.4. Use of the VSR

The Department of the Navy may make full and free public disclosure of the Validation Summary Report (VSR) in accordance with the "Freedom of Information Act" (5 U.S.C. #552). The results of the validation are only for the purposes of satisfying United States Government requirements, and apply only to the computer system, operating system release, and compiler version identified in the VSR.

The FORTRAN Compiler Validation System is used to determine, insofar as is practical, the degree to which the subject compiler conforms to the FORTRAN Standard. Thus, the VSP is necessarily discretionary and judgmental. The United States Government does not represent or warrant that the statements, or any one of them, set forth in the VSR are accurate or complete. The VSR is not meant to be used for the purpose of publicizing the findings summarized therein.

#### 1.5 Sources of Additional Information

The detailed FORTRAN language specifications are given in the publication "American Standard FORTRAN, X3.9-1966", available from the American National Standards Institute, 1430 Broadway, New York, New York 10018.

An explanation of the FORTRAN Compiler Validation System is contained in the FCVS User's Guide. This document explains how to run the compiler validation system. The User's Guide and a magnetic tape containing a copy of the FCVS programs are available from the National Technical Information Services, 5285 Port Royal Road, Springfield, Virginia, 22151. (Ordering information can be obtained from the Federal COBOL Compiler Testing Service.)

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**SECTION 2. DETAILED EVALUATION OF ERRORS.**

This section summarizes the results of the compilation and execution of the programs comprising the FORTRAN Compiler Validation System (FCVS). The version of the FCVS used during this validation is shown inside the front cover of the VSR.

Section 2 is made up of two subsections. The first subsection describes each syntax error encountered during compilation of the audit routines, and the second subsection describes the semantic errors encountered during execution of the audit routines.

Each error or deviation noted in this section makes reference to a program contained in Appendix A (Validation Summary Working Document). This reference provides the documented results of an occurrence of errors/deviations detected during the running of the FCVS using the compiler within the environment identified in this document. The Validation Summary Working Document is presented in sequence by program number.

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2.1 Syntactical Errors

No syntactical errors occurred during the compilation of the FCVS audit routines.

2.2 Semantic Errors

No semantic errors occurred during the execution of the FCVS audit routines.

SECTION 3. SOFTWARE ENVIRONMENT.

The compiler referenced in this document was validated using the software environment described in this section. When using a modification of the described environment, the compiler may or may not continue to conform to the Standard. It should be noted that during the validation process, an attempt is made to validate as many different options as possible.

The use of compiler options, logical unit/physical device assignments, and any form of optimization which is not described in this report could cause the compiler to produce a program that does not perform according to the specifications of Standard FORTRAN. Only the environment described in this document has been used with this compiler to satisfy the validation requirements of the Department of the Navy.

1. Options or parameters used on the processor call statement for the compiler.

Options specified:

a. Batch - Without Optimization.

```
$      FORTRAN  LSTIN  
$      INCODE   IBMF
```

b. Batch - With Optimization.

```
$      FORTRAN  LSTIN,OPTZ  
$      INCODE   IBMF
```

c. Time-sharing - Without Optimization.

```
RUN    TEMPX=(FORM) #LSHAW1"07"
```

d. Time-sharing - With Optimization.

```
RUN    TEMPX=(FORM,OPTZ) #LSHAW1"07"
```

2. Logical Unit/Physical Device Assignments.

a. Batch Compiler Runs.

Printer Destined Files:

Logical unit 06 was assigned to SYSOUT.

Tape Files:

Logical unit 07 was assigned to a tape file by using the

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following two control cards.

```
$      TAPE9    07,X1S
$      FFILE    07,NOSLEW
```

Sequential Mass-storage Files:

Logical unit 07 was assigned to a mass-storage file by using the following two control cards.

```
$      FILE     07,X1S
$      FFILE    07,NOSLEW
```

Card Input Files:

Logical unit 05 was assigned to GIN.

b. Time-sharing Compiler Runs.

Printer Destined Files:

The output reports were printed on the terminal device.

Sequential Mass-storage Files:

Assignment of logical unit 07 to a mass-storage file was made through the RUN command.

Card Input Files:

The input data for audit routine FM015 was entered from the terminal device.

3. Optimization. The compiler may or may not have optimization features. If there was an optimization feature available, it was used during the validation process (during a separate execution of the Compiler Validation System) to determine if its use causes the compiler to produce a program which does not give the expected results. If the optimization is invoked through the compiler call statement then it is mentioned in paragraph 1 above. If it is invoked through the introduction of a compiler directing source program statements, it is shown below. Optimization which would require modification to source program statements is not considered in this report in that it is beyond the scope of the use of Standard FORTRAN and the validation process.

The optimization feature for this compiler is invoked through the compiler

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call statement. See 1. above. There was no difference in the execution results when the optimization feature was invoked.

4. Compiler.

FORTRAN Release 3I

5. Operating system.

GCOS 3I

APPENDIX A  
VALIDATION SUMMARY WORKING DOCUMENT

This appendix is a working paper produced during the validation and documents the results of the compilation and execution of each of the programs comprising the FCVS. The results contained herein are based on the use of the compiler within the Validation Environment identified in this appendix. This appendix (Validation Summary Working Document) is not part of the official Validation Summary Report (VSR), and it is not intended to reflect in any way the compiler's usefulness or degree of conformance to the language specifications.

The reader of this appendix should keep in mind that the same problem area may appear in more than one program but is considered only as a single discrepancy, and the problem is reflected only once in the body of the VSR. (The VSR will in turn only reference the first occurrence of the problem in the appendix.)

This appendix is divided into four parts. The first part describes the Validation Environment. The second part lists the Monitor Input Cards used in creating a job control stream for execution in the batch mode. The third part shows the control cards required to compile and execute an individual program. The fourth part of the document is divided into two categories of information: compilation results and execution results. Information items, such as compiler warning messages, are included in the summary of compilation and execution results.

The reference document for FORTRAN is American Standard FORTRAN, X3.9-1966.

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VALIDATION ENVIRONMENT

COMPILER IDENTIFICATION: FORTRAN Release 3I

COMPUTER SYSTEM: Honeywell System Level 66

OPERATING SYSTEM: GCOS 3I

Each of the programs comprising the FCVS was compiled and executed twice in the batch mode. First, the programs were compiled and executed without the compiler optimization feature, and then the programs were compiled and executed with the compiler optimization feature requested. In addition, the programs which test I/O, FM100 through FM10E, were run both with and without optimization. The programs were first run with the output logical unit assigned to a tape device, and then rerun with the unit assigned to a mass-storage device.

The FORTRAN compiler for this system was also validated by compiling and executing the programs under the time-sharing system. As in the batch mode, the programs were run without optimization and with optimization requested. The output logical unit for the test results was the terminal device, and the output logical units for the I/O tests were assigned to mass-storage devices.

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CCVS MONITOR INPUT CARDS

The C CVS Executive Routine was used to prepare the FCVS programs for execution in the batch mode. The Monitor Control Cards used as input to the C CVS Executive are listed below:

```
*LIST
*CCVS      74
I-0100
B-0116JS    SNUMB    XXXXX
B-0200JS    IDENT
B-0350JS    USERID   $$$$$$$$$$$
B-0400SS    OPTION   FORTRAN
B-0560SS    SELECT   AUDIT/FRONT-FT
B-0600SS    INCODE   IBMF
B-0700
D-0100 $    INCODE   IBMF
E-0100 $    SELECT   AUDIT/END-FT
E-0200 BREAK**
E-0300 SORT****
E-0400 DATA****
E-0500JS    ENDJOB
E-0600
```

(FORTRAN routine selection cards)

```
*DATE      yymmdd
*END-M
```

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CONTROL CARDS FOR RUNNING FCVS PROGRAM

The job control stream for an individual program consisted of the following control cards:

```
$      SNUMB   FMnnn
$      IDENT   identification information
$      USERID  user identification
$      OPTION  FORTRAN
$      FORTRAN LSTIN,OPTZ
$      INCODE  IBMF

(FORTRAN source program FMnnn)

$      EXECUTE
$      FILE    07,X1S
$      FFILE   07,NOSLEW
$      ENDJOB
```

RUN SUMMARIES

FM001 through FM012

A. Compilation

No errors.

B. Execution

No errors.

FM013

A. Compilation

The statement

GO TO I, (1262,1263,1264)

where neither 1262 nor 1264 appear in an ASSIGN statement  
generates the warning messages

1262 NEVER APPEARS IN A LABEL ASSIGNMENT STATEMENT  
1264 NEVER APPEARS IN A LABEL ASSIGNMENT STATEMENT

These are valid warning messages.

B. Execution

No errors.

FM014

A. Compilation

No errors.

B. Execution

No errors.

FM015

A. Compilation

No errors.

B. Execution

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1. The STOP statement, STOP 0247, generates the message  
STOP AT LINE 247 .....
2. The PAUSE statement, PAUSE 0123, displays the line  
PAUSE 123

The above results are not considered errors and are included for completeness only. For the PAUSE statement the FORTRAN Standard states, "At the time of cessation of execution the octal digit string is accessible".

FM016 through FM021

- A. Compilation  
No errors.
- B. Execution  
No errors.

FM022

- A. Compilation  
The logical IF statement comparing two real array elements  
IF (RADN11(2) .EQ. RADN11(3))  
generates the warning message  
EQUALITY OR NON-EQUALITY COMPARISON MAY NOT BE MEANINGFUL IN  
LOGICAL IF EXPRESSIONS.  
This is a valid warning message.

- B. Execution  
No errors.

FM023 through FM045

- A. Compilation  
No errors.
- B. Execution

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No errors.

FM050 through FM062

A. Compilation

No errors.

B. Execution

No errors.

FM080 through FM083

A. Compilation

No errors.

B. Execution

No errors.

FM097 through FM099

A. Compilation

No errors.

B. Execution

No errors.

FORTRAN I/O Routines - FM100 through FM109

In the batch mode, the I/O routines were executed with the output logical unit assigned to a tape device and rerun with the output logical unit assigned to a mass-storage device. For the time-sharing runs, the I/O routines were executed with the output logical unit assigned to a mass-storage device.

FM100

A. Compilation

No errors.

B. Execution

No errors.

FM101

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A. Compilation

The warning message

INCOMPATIBLE W.D FIELD IN "F" SPECIFICATION

occurred for the specifications F2.1, F3.2, F4.3, F5.4, and F6.5.

B. Execution

No errors. The specifications flagged by warning messages were handled correctly.

FM102

A. Compilation

No errors.

B. Execution

No errors.

FM103

A. Compilation

The warning message

INCOMPATIBLE W.D FIELD IN "F" SPECIFICATION

occurred for the specification F5.4.

B. Execution

No errors. The specification flagged by a warning message was handled correctly.

FM104 through FM109

A. Compilation

No errors.

B. Execution

No errors.